REMARKS

This is a full and timely response to the non-final Official Action mailed September 5, 2001. Reexamination and reconsideration in light of the above amendments and the following remarks are courteously requested.

By the foregoing amendment, claims 1, and 6 to 7 have been amended. No claims are added or canceled. Thus, claims 1 to 7 are currently pending for the Examiner's consideration.

In the Office Action, the Examiner objected to claims 6 to 7 as failing to further limit the claims from which they depend. Although the objection is respectfully traversed, the present amendment renders the objection moot, as these claims are hereby written in independent form.

The Examiner rejected 1 to 4, and 6 to 7 under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,946,531 ("Crouch"). The Examiner also cites U.S. Patent No. 6,329,041 ("Tsuchiya"), U.S. Patent No. 5,378,735 ("Hosokawa"), and U.S. Patent No. 5,250,723 ("Suzuki") as individually anticipating least claim 1 under 35 U.S.C. § 102 because each of the references discloses hard coatings for plastic films where the hard coating includes radical-polymerizing material having two or more (meth) acryloyl groups in a molecule.

Applicants agree that there is some similarity between at least some compounds of the present invention and the prior

art. For example, see Tsuchiya col. 4, line 61 to col. 5, line 23; Hosokawa col. 4, lines 24 to 46; Crouch col. 4, lines 41 to 60, and col. 5, lines 3 to 47; Suzuki col. 8, line 56 to col. 9, line 52, as each of these passages disclose compounds containing two or more (meth) acryloyl groups as part of a hard coating material.

Despite the similarities mentioned above, it is well settled that similarity between the prior art and a claimed invention is not sufficient basis for a rejection under 35 U.S.C. § 102. "A claim is anticipated [under 35 U.S.C. § 102] only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." Verdegaal Bros. v. Union Oil Co. of California, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). See M.P.E.P. § 2131.

Claim 1 recites discrete ranges of elongation percentage and thickness for the claimed plastic film, where the hard-coating layer will not crack when the overall plastic film is within those ranges. The prior art fails to teach or suggest these discrete ranges, and the Examiner acknowledges this deficiency.

However, the Examiner asserts that the mere mention in the prior art of a hard layer that shares some of the same chemicals and has some resistance to cracking is sufficient to anticipate the present claims. While the prior art clearly

fails to explicitly suggest the ranges of the claims, the Examiner apparently is of the opinion that the ranges are inherent in the films of the prior art. The following discussion exhibits just a few reasons that the prior art fails to inherently anticipate the claims.

Crouch and Tuchiya explicitly require that zero solvent is used in the hard coating solution. Although not presently claimed, the specification clearly explains that when solvent is used in solution, the end product has greater adhesive properties than when the solvent is absent (page 15). The uniformly adhered hard coating of the present invention is more resistant to cracking due to evenness of tension when performing a tensile test. Consequently, despite the fact that there is no recitation of the use of solvent in the claims, this feature is one reason for that the present invention meets the recited elongation ranges without cracking. There is no evidentiary support for the position that Crouch or Tuchiya would inherently teach a hard coating layer that satisfies the explicit ranges set forth in claim 1, and the lack of solvent in these references exemplifies why these references do not inherently anticipate the claims.

Further, according to the Crouch process, polycarbonate film is cured to obtain a hard-coated film, which is then wrapped around the circumference of a cylinder of a radius of 3 inches. Claims 7 and 8 of the present application further

recite that the ranges of claim 1 are applicable when the hard-coat layer is formed by injection molding. Because Crouch never intends to form the hard-coat by injection molding, it can not be assumed that the hard-coat of Crouch is suitable for the stress levels that the plastic film of the present invention is subject to according to the ranges of claim 1. The same reasoning applies to Tuchiya, as Tuchiya teaches curing a coat layer to obtain a hard-coat film, but fails to mention the formation of the film by injection molding.

There are also many differences between Hosokawa and the present invention, and these differences evidence how Hosokawa fails to inherently teach a hard-coat that resists cracking under the ranges set forth in claim 1 of the present application. Hosokawa teaches that silica sol compounds exist (as component C) in the hard covering composition. In contrast, the present invention makes no mention whatsoever of silica sol compounds. In fact, preferably all compounds that form part of the hard coating material are multi-functional (meth) acrylate compounds. Although this chemical difference is not recited in the claims, it is one reason why the film of the present invention resists cracking under the claimed elongation ranges, and also why the Hosokawa reference fails to inherently anticipate the claims.

Further, when comparing the specifications of Hosokawa and

the present application, it is clear that the Hosokawa films are not as durable, and therefore as crack resistant, as the present films. Hosokawa teaches that a multilayer structure is resistant to cracking when subjected to temperatures of 185°C, but does not teach or suggest that such a structure is resistant to cracking at much higher temperatures.

In contrast, the present invention claims a multilayer structure that has a base film of 500 μm or more, and is resistant to cracking when subjected to temperatures as high as 315°C (page 24, lines 20 to 21). Incidentally, the present specification recites that "the temperature of the molten resin used at the time of injection molding is … 310 to 320°C in the case of polycarbonate." (page 4, line 24 to page 5, line 9). The resistance to cracking is further supported by the Examples in the present application.

While the claims do not include a recitation of crack resistance at elevated temperatures, the ranges for resilience during a tensile test represent the superior crack resistance of the present invention. The fact that Hosokawa fails to teach or suggest crack resistance at elevated temperatures is evidence that Hosokawa fails to teach or suggest the crack resistance of the present invention under the ranges recited in claim 1.

Finally, Suzuki teaches that in addition to component (B) which could be (meth) acrylic acid compounds, a second

component (A) is present in the material that makes up the hard coating. In contrast, the present invention makes no mention whatsoever of copolymerizing (meth) acrylic acid compounds with other monomers such as those defined in Suzuki as component (A). In fact, preferably all compounds that form part of the hard coating material are multi-functional (meth) acrylate compounds. Although this chemical difference is not recited in the claims, it is one reason why the film of the present invention resists cracking under the claimed elongation ranges, and also why the Hosokawa reference fails to inherently anticipate the claims.

Further, according to the Suzuki process, a uniform solution of monomers to be formed into a hard transparent resin is poured into a mold, and polymerization is affected in the mold to obtain a hard transparent resin article (Examples 19 to 25). However, the obtained hard transparent resin article does not have a multilayer structure

Further, Suzuki never intends to form a hard-coat by injection molding, it can not be assumed that the hard-coat of Suzuki is suitable for the stress levels that the plastic film of the present invention is subject to according to the ranges of claim 1.

From the above, it clear that none of the prior art references individually teaches or suggests the features of at least claim 1. For these reasons, it is respectfully that the

rejections under 35 U.S.C. § 102 be withdrawn.

The Examiner rejected claims 2 to 5 under 35 U.S.C. § 103(a) as being unpatentable over various combinations of the above-discussed prior art. These rejections are respectfully traversed based on the reasons set forth above. None of the prior art references, individually or combined with one another, teaches or suggests the a transparent plastic film that is crack resistant during a tensile strength test under the ranges set forth in claim 1. Consequently, the rejections should be withdrawn.

For the foregoing reasons, all the claims now pending in the present application are believed to be clearly patentable over the prior art of record. Accordingly, favorable reconsideration of the claims in light of the above remarks is courteously solicited. If the Examiner has any comments or suggestions that could place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the below-listed number.

Respectfully submitted,

DATE: 6 December 2002

David K. Benson
Registration No. 42,314

RADER, FISHMAN & GRAUER, PLLC
Lion Building
1233 20th Street, N.W.
Washington, D.C. 20036
Tel: (202) 955-3750
Fax: (202) 955-3751

Appendix

Amendments to the Claims

1. (amended) A transparent plastic film having a hard-coating layer on one surface of a plastic base film, wherein, with x (μm) representing a thickness of said base film, and y (%) representing an elongation percentage at the time when said plastic film having the hard-coating layer is pulled under a condition at 22°C with one side fixed and at a pulling speed of 20 mm/min, no crack is generated in the hard-coating layer in a region satisfying a relationship:

$y < 5.7$ if $x \leq 100$,

$y < -0.018X + 7.5$ if $100 \leq x \leq 150$,

$y < -0.008x + 6.0$ if $150 \leq x \leq 200$,

$y < -0.005x + 5.4$ if $200 \leq x \leq 300$,

$y < -0.003x + 4.8$ of $300 \leq x \leq 400$, and

$y < -0.002x + 4.4$ if $400 \leq x \leq 500$, [and

$y < 3.4$ if $500 \leq x$,]

when a tensile test is carried out under said condition,

wherein said plastic base film has a thickness of 500 μm or less.

6. (amended) [The transparent plastic film having the hard-coating layer according to any one of claims 1 to 3,

which is] A transparent plastic film having a hard-coating layer on one surface of a plastic base film, wherein, with x (μm) representing a thickness of said base film, and y (%) representing an elongation percentage at the time when said plastic film having the hard-coating layer is pulled under a condition at 22°C with one side fixed and at a pulling speed of 20 mm/min, no crack is generated in the hard-coating layer in a region satisfying a relationship:

$y < 5.7$ if $x \leq 100$,

$y < -0.018X + 7.5$ if $100 \leq x \leq 150$,

$y < -0.008x + 6.0$ if $150 \leq x \leq 200$,

$y < -0.005x + 5.4$ if $200 \leq x \leq 300$,

$y < -0.003x + 4.8$ of $300 \leq x \leq 400$, and

$y < -0.002x + 4.4$ if $400 \leq x \leq 500$,

when a tensile test is carried out under said condition,

wherein said plastic base film has a thickness of 500 μm or less, and said transparent plastic film is used for obtaining a molded article having the hard-coating layer given thereto by setting the transparent plastic film having the hard-coating layer on one surface of the plastic base film so that the hard-coating layer faces towards one mold surface in a mold for injection molding, clamping the plastic film so that a cavity is formed between a base surface of said film and the other mold surface, thereafter injecting a molten

resin into said cavity and cooling the resin to mold a molded article body, and simultaneously to laminate and integrate said plastic film on a surface of the molded article body, in producing the plastic molded article by injection molding.

7. (amended) [The transparent plastic film having the hard-coating layer according to any one of claims 1 to 3, which is] A transparent plastic film having a hard-coating layer on one surface of a plastic base film, wherein, with x (μm) representing a thickness of said base film, and y (%) representing an elongation percentage at the time when said plastic film having the hard-coating layer is pulled under a condition at 22°C with one side fixed and at a pulling speed of 20 mm/min, no crack is generated in the hard-coating layer in a region satisfying a relationship:

$y < 5.7$ if $x \leq 100$,

$y < -0.018X + 7.5$ if $100 \leq x \leq 150$,

$y < -0.008x + 6.0$ if $150 \leq x \leq 200$,

$y < -0.005x + 5.4$ if $200 \leq x \leq 300$,

$y < -0.003x + 4.8$ of $300 \leq x \leq 400$, and

$y < -0.002x + 4.4$ if $400 \leq x \leq 500$,

when a tensile test is carried out under said condition,

wherein said plastic base film has a thickness of 500 μm or less, and said transparent plastic film is used for

obtaining a plate-shaped molded article having the hard-coating layers given thereto on both surfaces by setting two sheets of the transparent plastic films having the hard-coating layer on one surface of the plastic base film so that the hard-coating layers respectively face towards one mold surface and the other mold surface in a mold for injection molding, clamping the plastic film so that a cavity is formed between base surfaces of said two sheets of the films, thereafter injecting a molten resin into said cavity and cooling the resin to mold a molded article body, and simultaneously to laminate and integrate said plastic films on both surfaces of the molded article body, in producing the plastic plate-shaped molded article by injection molding.